

BOOK REVIEWS

High-Tech Dynamics

Regional Advantage. Culture and Competition in Silicon Valley and Route 128. ANNALEE SAXENIAN. Harvard University Press, Cambridge, MA, 1994. xiv, 226 pp., illus. \$24.95 or £19.95.

Silicon Valley and Route 128 burst into the collective imagination of the nation and much of the world during the high-flying 1980s. With fast-growing start-up companies, a growing stable of entrepreneur celebrities, abundant venture capital, world-class universities, and a seemingly endless ability to generate wave after wave of breakthrough innovations, Silicon Valley and Route 128 became the regional equivalents of a Horatio Alger story. Some went so far as to argue that together these regions provided a high-technology growth model for others to follow, touting the development of the "next Silicon Valleys."

Regional Advantage provides a welcome addition to the growing literature on American high technology, offering fresh insights in a thorough, if somewhat boosterish, account of the economic and technological evolution of America's premier high-technology regions. Packed into 162 highly readable pages of text (augmented by appendixes and references) are the findings from more than a decade of research by the author.

The book's main message is basic: Though there is much alike about America's two premier high-technology regions, a rather fundamental—and frequently overlooked—factor sets them apart. Both trace their origins to Cold War technologies that propelled the rise of new high-technology firms, industries, and regions. Both emerged as vibrant complexes of technology, entrepreneurship, and venture capital during the 1970s; and by the early 1980s both faced severe economic downturns. But over the course of the 1980s and early 1990s, the author argues, Silicon Valley was able to recapture much of its technological and economic dynamism, while Route 128 could not and continued to decline.

The roots of this difference lie in the emergence of a decentralized, *network* system of technological and industrial organization in Silicon Valley that encourages

innovation, collaboration, and collective learning among companies and enables them to respond quickly to changing markets and technology. In fact, the author argues, the reemergence of Silicon Valley during the 1980s was based on a new generation of start-up firms such as Cypress Semiconductors, Chips and Technologies, Cirrus Logic, Maxim Integrated Products, Silicon Graphics, Sun Microsystems, MIPS, and countless others that were flexible and diversified enough to capitalize on the ceaseless revolution in high-technology products and markets. Route 128, in contrast, remained dominated by a few large, relatively independent companies like DEC, leaving the region less able to adapt to these dramatic changes.

Despite its rich institutional analysis, *Regional Advantage* tells only one side of the story. Emphasizing the importance of collaboration and trust in the early rise and reawakening of Silicon Valley, the book neglects the role played by highly competitive local markets of the sort Harvard Business School professor Michael Porter identifies as a key source of competitive advantage. Focusing on cooperation and collective learning as a source of innovation, it overlooks the high degree of fragmentation, chronic entrepreneurship, and extreme litigiousness that have equally defined the Silicon Valley style of high technology. Indeed, the inability of Silicon Valley companies and public agencies to work together for common ends has recently spawned the Valley's first significant attempt at regional economic coordination, Joint Venture: Silicon Valley, whose stated mission is to transform the "valley of entrepreneurs into an entrepreneurial valley." The author sees open and flexible local labor markets—the ability to move quickly and easily from job to job—as a source of regional advantage, but this kind of job-hopping also generates substantial costs by disrupting ongoing R&D efforts and encouraging defections that can sap the creative energy of large and small companies alike. Missing too from this rather romantic account of American high technology is the human toll taken by a pressure-cooker environment and the round-the-clock working hours required to generate new breakthroughs in record time, the low wages and onerous working

conditions that confront a large fraction of high-technology factory workers.

Focusing almost exclusively on what is happening inside America's leading high-technology regions, *Regional Advantage* also does not adequately address the global dimensions of high-technology industry. Regions like Silicon Valley and Route 128 provide the source of new ideas and innovations for increasingly global high-technology production systems. One aspect of this is the movement of routine factory production to places like Mexico, Malaysia, Thailand, and even India and China. Another is the out-migration of advanced semiconductor and computer production to new industrial complexes in and around Austin, Texas; Phoenix, Arizona; Albuquerque, New Mexico; and Portland, Oregon—an industrial exodus that has motivated the first organized attempt to bolster the Valley's business climate. Silicon Valley's global dimensions are also evident in an inflow of foreign capital to many of its most innovative companies—General Magic, Kaleida, Silicon Graphics, and 3DO to name just a few.

Business leaders and public policy makers have much to learn from the flexible and adaptive network industrial system of Silicon Valley, argues Saxenian. Centralized national technology or industrial policies that attempt to "pick winners" and focus national resources on particular sectors or future technologies, she contends, are out of sync with the accelerating pace of innovation, shrinking product-development cycles, and fragmenting global markets. Echoing the arguments of Charles Sabel of MIT, who has maintained that advanced industrial societies are shifting from an old mass-production industrial order dominated by large corporations to a new industrial paradigm of "flexible specialization" made up of tightly networked and highly collaborative groups of small firms, Saxenian contends that a more effective path to economic and technological improvement lies in bolstering regional networks and capabilities: "fostering the collective identities and trust to support the formation and elaboration of local networks" (p. 167). Though there are many reasons to be wary of government initiatives focused on so-called "critical technologies," there is little reason to believe that the regional "public forums" and institutional mechanisms for generating regional "collective action" will be effective in meeting the stresses and strains produced by the sweeping technological and industrial transformation of the world economy. Meeting such challenges will require whole new approaches to economic, trade, and technology policy at the international and national levels, as well

as efforts at regional collaboration of the sort the author advocates.

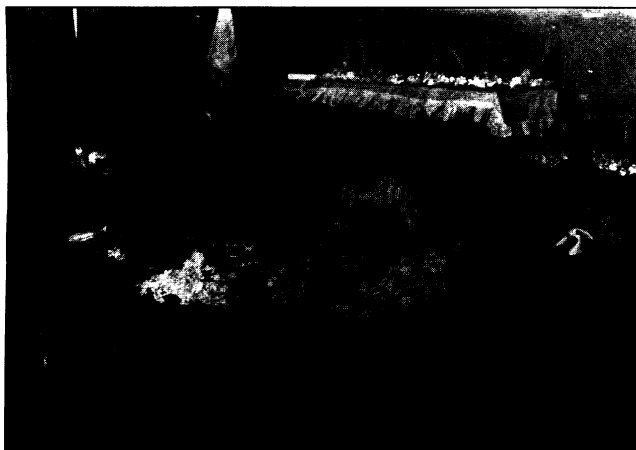
Despite these shortcomings, *Regional Advantage* provides a much-needed synthesis of research on the subject and a wealth of useful information on America's premier high-technology regions. One can only hope that the author will extend her analysis to address the more problematic aspects of American-style high-technology networks.

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Disease and Dread

Silent Travelers. Germs, Genes, and the "Immigrant Menace." ALAN M. KRAUT. Basic Books, New York, 1994. xiv, 369 pp., illus. \$25.

Accounts of American immigration have seldom focused in detail on the multiple health issues surrounding the arrival of millions of people to our shores during the past three centuries. Cultural and political issues dominate most historical reviews, with an occasional remark about the lack of hygiene and physical fortitude of many newcomers. But, as Kraut remarks in his introduction to *Silent Travelers*, the first encounter for most immigrants landing on our shores has been with a physician. I vividly remember a gray Saturday afternoon in late September 1958 as the freighter bound for Brooklyn that carried me to my new life in America stopped near the quarantine station at Staten Island. Soon, physicians of the U.S.



"Italian artificial flower makers engaged in homework in New York tenement, 1908. Reformers blamed the congested conditions and long hours for high rates of morbidity from such contagious diseases as measles, scarlet fever, and tuberculosis." [From *Silent Travelers*; U.S. National Archives]

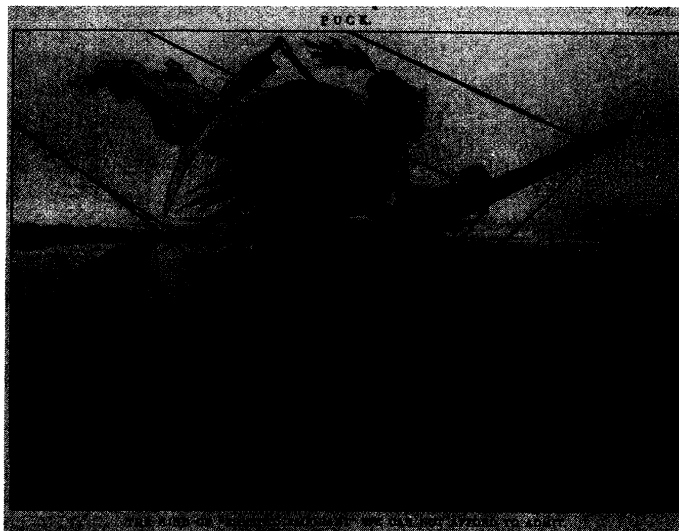
Public Health Service climbed on board to check our health certificates and study with great care my chest x-ray revealing a primary, calcified tuberculous lesion I had acquired during a clinical rotation in a sanitarium while going through medical school. My future career was at stake; an unfavorable medical judgment would have meant isolation and possible repatriation.

Much has been learned in recent decades about the shifting ecology of human disease, its temporal and geographical dynamics, and, most important, the impact of migration. Drawing on a series of epidemiological and immunological findings, we now can speak of "virgin-soil" epidemics, episodes of mass disease occurring in isolated populations previously untouched by particular bacterial or viral agents introduced through contact with carriers and victims of these diseases. While the stark reality of successive and devastating epidemics decimating indigenous populations is now widely accepted, demographers, historians, and epidemiologists remain divided about the scope and rate of human destruction and about its causes. As with all instances of sickness, further susceptibilities to disease turn out to be genetic.

The subtitle of Kraut's book, "Germs, Genes, and the 'Immigrant Menace,'" thus provides readers with a clue to the author's intentions: to chronicle a series of epidemic encounters between immigrants and established American residents, from Columbus's first voyages to the New World until the early 1990s, when a resurgence of drug-resistant tuberculosis was in part blamed on Asian newcomers. Though the biological factors operative in such exchanges of disease are mentioned, Kraut is primarily concerned with the social aspects of these encounters. The book vividly documents the construction of a particularly virulent strain of xenophobia in America that is still very much alive today, as demonstrated by events surrounding the AIDS epidemic.

Not surprisingly, as Kraut's account shows, medicine and eventually science played important roles both in shaping and in validating such prejudices. Shifting definitions of health and disease were employed to create notions of the unhealthy "other"—in this case immigrants—silently bringing their baggage of sickness to the pristine shores of a new continent and then spreading it in an exercise of ignorance, irresponsibility, or even deception. Motivated by perception of "menaces" and preoccupied with notions of what was truly "fit" for America, public policies sought to isolate and exclude newcomers. The twin engines of fear and prejudice propelled these efforts, depicted by Kraut in vivid detail, often from the point of view of eyewitnesses.

Readers interested in the events surrounding Columbus's discovery of America and the exchange of diseases between the arriving Europeans and the Native Americans who inhabited the Caribbean islands will find a useful summary in the first chapter. Much has been written recently on the demographic collapse of indigenous American populations, a highly politicized subject concerning which estimates diverge widely. To explain this disaster, biological susceptibilities of the American natives are stressed, including their genetic uniformity and immunological incompetence. Though it is proper to highlight the biological components of the massive die-off of American natives, one must not understate the equally important social factors that helped to foster such a string of deadly epidemics. Initially, the aggressive conquerors practiced a



"Members of the New York Municipal Board of Health (foreground) armed with a bottle of carbolic acid to fight off cholera arriving in the port of New York, 1883." [From *Silent Travelers*; Puck]